

No.



8200054

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Pioneer Hi-Bred International, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT OF SEPTEMBER 22, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

COMMON WHEAT

'2550'



In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington this 17th day of June in the year of our Lord one thousand nine hundred and eighty-two.

Attest:

Kenneth H. Egan
Acting
Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

John R. Block
Secretary of Agriculture

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION

FORM APPROVED
OMB NO. 40-R3822

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

No certificate for plant variety protection may be issued unless a completed application form has been received (5 U.S.C. 553).

INSTRUCTIONS: See Reverse.

1a. TEMPORARY DESIGNATION OF VARIETY W689D		1b. VARIETY NAME 2550		FOR OFFICIAL USE ONLY PV NUMBER 8200054	
2. KIND NAME Wheat		3. GENUS AND SPECIES NAME <i>Triticum aestivum</i>		FILING DATE 1/18/82	TIME 3:00 <u>P.M.</u>
4. FAMILY NAME (BOTANICAL) gramineae		5. DATE OF DETERMINATION September 1, 1978		FEE RECEIVED \$ 500.00 \$ 250.00	DATE 1/18/82 4/26/82
6. NAME OF APPLICANT(S) Pioneer Hi-Bred Int'l., Inc. Plant Breeding Division Dept. of Cereal Seed Breeding		7. ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) Rt. 2 Hutchinson, Kansas 67501		8. TELEPHONE AREA CODE AND NUMBER (316) 662-5439	
9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: (Corporation, partnership, association, etc.) Corporation		10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION Iowa May, 1926		11. DATE OF INCORPORATION May, 1926	
12. NAME AND MAILING ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS: Dr. Charles Hayward Pioneer Hi-Bred International, Inc. Rt. 2 Hutchinson, Kansas 67501					

13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:

- ☒ 13A. Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)
- ☒ 13B. Exhibit B, Novelty Statement.
- ☒ 13C. Exhibit C, Objective Description of the Variety (Request form from Plant Variety Protection Office.)
- ☒ 13D. Exhibit D, Additional Description of the Variety.

14a. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a). (If "Yes," answer 14B and 14C below.)		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
14b. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?	14c. IF "YES," TO 14B, HOW MANY GENERATIONS OF PRODUCTION BEYOND BREEDER SEED?		
<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED		
15a. DID THE APPLICANT(S) FILE FOR PROTECTION OF THIS VARIETY IN OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO (If "Yes," give name of countries and dates.)			

15b. HAVE RIGHTS BEEN GRANTED THIS VARIETY IN OTHER COUNTRIES? ☐ YES ☒ NO (If "Yes," give name of countries and dates.)

16. DOES THE APPLICANT(S) AGREE TO THE PUBLICATION OF HIS/HER (THEIR) NAME(S) AND ADDRESS IN THE OFFICIAL JOURNAL? ☐ YES ☐ NO

17. The applicant(s) declare(s) that a viable sample of basic seed of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

November 25, 1981
(DATE)

Charles F. Hayward
(SIGNATURE OF APPLICANT)

(DATE)

(SIGNATURE OF APPLICANT)

13A. Exhibit A. Origin and Breeding History of 2550 Wheat

Pioneer variety '2550', *Triticum aestivum* L., em Thell., a soft red winter wheat, was developed by Pioneer Hi-Bred International, Inc., from the cross 'Coker 68-15'/4/'Etoile de Choisy'/'Thorne'/'Clarkan'/3/C113390. A semidwarf mutant was selected from the Etoile de Choisy//Thorne/Clarkan cross. This mutant was crossed to C113390. A pure line selection from this cross was crossed to Coker 68-15.

The F_1 generation was grown in the field at Hutchinson, Kansas, in 1969-70. F_2 seed was space planted in the fall of 1970. In the spring of 1971, 100 F_2 plant selections were made (for plant height, straw strength, maturity and head type) and planted to single increase rows at two locations in the fall of 1971. One of 23 increase rows selected in 1972 (for winterhardiness, height, maturity, straw strength, disease resistance and for plant and head type) was assigned the Pioneer selection number W689 and advanced to preliminary yield trials in 1972-73. A reselection, designated as W689D and tracing to a single F_4 plant, was made in 1975. W689D has been tested in yield trials and for milling and baking quality since 1976-77. From 500 F_8 head rows grown in 1978-79, 415 were harvested and bulked for breeder's seed. Following the 1980-81 harvest, W689D was designated to be sold as Pioneer Variety 2550.

2550 has shown uniformity and stability for all traits as described in Exhibit C (Form LPGS-470-6) -- "Objective Description of Variety."

The only variant observed and expected in 2550 is a very low frequency of awns ($< 1/30,000$).

13B. Exhibit B. Novelty Statement

2550 is most similar to the soft red winter variety S76 in a number of plant and seed characteristics. Certain similarities are expected since one half the parentage of 2550 and S76 is the same. However, there are a number of distinguishable differences between the two varieties. The most easily recognized difference is that S76 is awned and 2550 is awnleted. Plant height of 2550 averages about 4 cm shorter. Less notable differences between the two varieties are: The plant color of 2550 at booting stage is a distinct blue-green while S76 is green to slight blue-green. A heavy waxy bloom occurs on the stem and flag leaf sheath of 2550 while only a light and moderate waxy bloom occurs on the stem and flag leaf sheath respectively of S76. Shoulders of the glume are oblique on 2550 and wanting on S76. Beaks are acute on 2550 and acuminate on S76.

2550 is higher yielding and has a higher level of field resistance to prevalent races of leaf rust and powdery mildew than S76 (Table 1). S76 has better straw strength and more resistance to spindle streak mosaic virus and soil borne mosaic virus than 2550 (Table 1).

Since half the parentage of 2550 is Coker 68-15, there are similarities between 2550 and Coker 68-15. These varieties are readily distinguishable by their level of winterhardiness. In 1978 winterhardiness tests (1 - 9 scale with 9 being most winterhardy), the average readings were 7.0 and 3.0 for 2550 and Coker 68-15 respectively.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (TRITICUM SPP.)

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT(S)

Pioneer Hi-Bred International, Inc.

ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)

Plant Breeding Division
Department of Cereal Seed Breeding
Rt. 2
Hutchinson, Kansas 67501

FOR OFFICIAL USE ONLY

PVPO NUMBER

8200054

VARIETY NAME OR TEMPORARY DESIGNATION

2550

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g., 089 or 09) when number is either 99 or less or 9 or less.

1. KIND:

1 1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:

2 1 = SPRING 2 = WINTER 3 = OTHER (Specify) 1 1 = SOFT 2 = HARD 3 = OTHER (Specify)

2 1 = WHITE 2 = RED 3 = OTHER (Specify)

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:

229 FIRST FLOWERING 236 LAST FLOWERING

4. MATURITY (50% Flowering):

NO. OF DAYS EARLIER THAN 1 = ARTHUR 2 = SCOUT 3 = CHRIS
02 NO. OF DAYS LATER THAN 1 4 = LEMHI 5 = NUGAINES 6 = LEEDS

5. PLANT HEIGHT (From soil level to top of head):

095 CM. HIGH
 CM. TALLER THAN
04 CM. SHORTER THAN 1 1 = ARTHUR 2 = SCOUT 3 = CHRIS
4 = LEMHI 5 = NUGAINES 6 = LEEDS

6. PLANT COLOR AT BOOTING (See reverse):

3 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHR COLOR:

1 1 = YELLOW 2 = PURPLE

8. STEM:

1 Anthocyanin: 1 = ABSENT 2 = PRESENT 2 Waxy bloom: 1 = ABSENT 2 = PRESENT
1 Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT 1 Internodes: 1 = HOLLOW 2 = SOLID
04 NO. OF NODES (Originating from node above ground) 22 CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:

1 Anthocyanin: 1 = ABSENT 2 = PRESENT 1 Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:

2 Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 3 = OTHER (Specify) 1 Flag leaf: 1 = NOT TWISTED 2 = TWISTED
1 Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT 2 Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT
12 MM. LEAF WIDTH (First leaf below flag leaf) 23 CM. LEAF LENGTH (First leaf below flag leaf)

11. HEAD:

1 Density: 1 = LAX 2 = DENSE

1 Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE
4 = OTHER (Specify) _____

3 Awnedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

2 Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED
5 = BROWN 6 = BLACK 7 = OTHER (Specify) _____

0 8 CM. LENGTH

1 2 MM. WIDTH

12. GLUMES AT MATURITY:

3 Length: 1 = SHORT (CA. 7 mm.) 2 = MEDIUM (CA. 8 mm.)
3 = LONG (CA. 9 mm.)

3 Width: 1 = NARROW (CA. 3 mm.) 2 = MEDIUM (CA. 3.5 mm.)
3 = WIDE (CA. 4 mm.)

2 Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED
4 = SQUARE 5 = ELEVATED 6 = APICULATE

2 Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

13. COLEOPTILE COLOR:

1 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

1 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

2 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

1 Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL

1 Check: 1 = ROUNDED 2 = ANGULAR

2 Brush: 1 = SHORT 2 = MEDIUM 3 = LONG

1 Brush: 1 = NOT COLLARED 2 = COLLARED

4 Phenol reaction (See instructions): 1 = IVORY 2 = FAWN 3 = LT. BROWN
4 = BROWN 5 = BLACK (Very dark brown nearly black, similar to Monom)

3 Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER (Specify) _____

0 7 MM. LENGTH

0 3 MM. WIDTH

3 6 GM. PER 1000 SEEDS

17. SEED CREASE:

1 Width: 1 = 60% OR LESS OF KERNEL 'WINOKA'
2 = 80% OR LESS OF KERNEL 'CHRIS'
3 = NEARLY AS WIDE AS KERNEL 'LEMHI'

1 Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT'
2 = 35% OR LESS OF KERNEL 'CHRIS'
3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

1 STEM RUST (Races)

0 LEAF RUST (Races)

0 STRIPE RUST (Races)

1 LOOSE SMUT

1 POWDERY MILDEW

0 BUNT

2 OTHER (Specify) Soil Borne Mosaic Virus and Spindle Streak Mosaic Virus

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

0 SAWFLY

2 APHID (Bydv.)

0 GREEN BUG

0 CEREAL LEAF BEETLE

OTHER (Specify) _____

HESSIAN FLY

RACES:

2 GP 2 A 1 B 2 C

1 D 1 E 2 F 1 G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Abe	Seed size	Pioneer Variety S76
Leaf size	Abe	Seed shape	Pioneer Variety S76
Leaf color	McNair 1003	Glume elongation	Pioneer Variety S76
Leaf carriage	Abe	Seedling pigmentation	Pioneer Variety S76

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

- (a) L.W. Briggie and L.P. Sims, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.
- (b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. (See attachment.)

LEAF COLOR: Nickerson's or any recognized color fan should be used to determine the leaf color of the described variety.

13D. Exhibit D. Additional Description of the Variety

'2550' is a common soft red winter wheat, *Triticum aestivum* L.

Flowering date of 2550 is two days later than the variety Arthur and one day earlier than Pioneer variety S76. At Tipton, Indiana, when seeded about October 1, average first flowering is May 27 or about 229 days after emergence. Last flowering averages about 7 days later. It is recognized that environmental factors influence flowering of varieties differently.

2550 has averaged 95 cm in height, about 4 cm shorter than Arthur and Pioneer variety S76.

The plant color of 2550 at booting stage is a distinct blue-green while Arthur is green and Beau is dark green. Anther color of 2550 is yellow, similar to Pioneer variety S76.

Anthocyanin has been absent in the stem of 2550. A heavy waxy bloom occurs on the stem. Internodes of 2550 are hollow. At maturity, stems are yellow and strong. Normally four stem nodes are present above ground. Internode length between flag leaf and leaf below is about 22 cm. The last internode of the rachis is free of hairiness.

Auricles of 2550 are lacking in anthocyanin and free of hairiness.

Flag leaves are generally recurved at booting and are not twisted. Hairs are absent from the first leaf sheath. A heavy waxy bloom occurs on the flag leaf sheath. The first leaf below the flag leaf averages about 12 mm wide and 23 cm long.

Spikes are generally mid-dense to lax, tapering, awnleted, yellow and generally nodding at maturity. The apical awnlets are rough and about 15-20 mm long. Spike width and length averages about 12 mm and 8 cm, respectively. However, spike width and length are variable with plant population and level of production.

The glumes of 2550 are long and wide, glabrous and generally the shoulders are oblique. Beaks are acute.

Coleoptile color is white and seedling anthocyanin is absent. Juvenile plant growth habit is semi-erect.

Kernels are red in color, ovate in shape, with rounded cheeks and a shallow crease. The brush is not collared and medium in size. The embryo is large in size. Kernels average 7 mm long and 3 mm wide and weigh about

13D. Exhibit D. cont.

36 g per 1000. Phenol reaction is very dark brown, nearly black, similar to Monon.

2550 is moderately resistant to leaf rust (*Puccinia recondita* f. sp. *tritici*) and susceptible to stem rust (*P. graminis* f. sp. *tritici*) races currently common in the soft red winter wheat region. 2550 has not been tested for specific races of leaf rust nor has it been tested for stripe rust (*P. striiformis*), bunt (*Tilletia foetida* and *T. caries*) and loose smut (*Ustilago tritici*). While susceptible to powdery mildew (*Erysiphe graminis* f. sp. *tritici*), the progression of the disease up the plant is slow.

2550 has a good level of resistance to soil borne mosaic virus, spindle streak mosaic virus and barley yellow dwarf virus. In testing for BYDV, Clintland 64 oat variety was used as a very susceptible check, Abe as the susceptible wheat variety check and Hart as a wheat variety check with notable resistance. Results were as follows: Clintland 64 - 6; Abe - 5; Hart - 3; 2550 - 2.

2550 is resistant to Hessian fly races GP, A, C and F and susceptible to races B, D, E and G. Hessian fly and BYDV tests were conducted by the Small Grains Insect Control Group, USDA-ARS, Department of Entomology, Purdue University, Lafayette, Indiana. 2550 has not been tested for sawfly, greenbug and cereal leaf beetle.

2550 has an excellent yield record when compared with the current leading soft red winter wheat varieties (Table 1). In the presence of soil borne mosaic virus or spindle streak mosaic virus, 2550 has a pronounced yield advantage over susceptible varieties. Short plant height and good straw strength give 2550 excellent resistance to lodging.

The milling and baking qualities of 2550 are generally equivalent to current varieties commonly grown in the SRW region. Flour protein is consistently lower (desirable) than Abe. It has better protein levels and break flour yields than Pioneer variety S76 (see Table 2).

Table 1

Performance of Pioneer Varieties 2550 and 2553 and Standard Varieties Grown in Elite Yield Trials (1978-81)*

Variety	Yield bu./acre	Test Weight lbs./bu.	Height cm	Days to Flowering After 4/1	Lodging** Score	Powdery** Mildew	Leaf** Rust	Spindle Streak**		Soil Borne**	
								Mosaic Virus	(3)	Mosaic Virus	(4)
2550	71.4	57.6	95	55.4	6.5	6.1	8.0	7.0			6.2
2553	68.0	59.0	96	55.7	8.2	3.8	6.8	8.0			7.0
S76	63.4	57.8	99	56.4	7.5	4.1	6.4	8.3			7.5
S78	62.6	57.5	93	57.2	6.8	3.5	7.3	8.7			5.8
Hart	62.4	57.8	103	55.1	6.7	4.1	5.7	7.7			7.0
Abe	60.2	58.7	99	54.3	4.7	6.2	4.5	4.7			4.2
Beau	59.9	59.4	99	54.8	6.2	6.6	4.9	5.0			4.0
Sullivan	58.1	59.2	103	53.6	4.5	6.2	5.5	4.0			5.8

*Data collected at the following locations for the years specified: Loogootee, IL; Ft. Branch and Tipton, IN (Normal planting) - 1978-81; St. Joseph, IL - 1979-81; Tiffin, OH - 1979; Perry, MI - 1980; Tipton, IN (Late planting) - 1980-81.

**Scale 1-9 where 9 = excellent or resistant and 1 = poor or 100% susceptible.

***Number in parenthesis = replications.

Soil Borne Mosaic Virus data collected at University of Illinois SBMV Nursery in 1979-80.

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Table 2

Results of Quality Testing on 2550
(Pioneer Wheat Quality Lab)

<u>Year/Sample</u>	<u>Flour Yield (%)</u>	<u>Break Flour (%)</u>	<u>Flour Protein (%)</u>	<u>AWRC (%)</u>	<u>Cookie Diam. (cm.)</u>	<u>PSI (%)</u>
<u>Avg. '77 Data (2 loc.)</u>						
2550	67.6	36.4	10.7	55.3	17.9	45.6
Abe	66.7	37.3	12.5	53.3	17.9	51.9
Avg. all checks	67.4	37.0	12.3	53.7	17.8	52.2
<u>Avg. '78 Data (3 loc.)</u>						
2550	66.0	35.9	7.5	54.3	19.7	44.8
Abe	68.2	35.4	8.3	51.4	19.2	51.1
Avg. all checks	65.6	35.3	8.7	53.9	19.3	48.8
<u>Avg. '79 Data (6 test/loc.)</u>						
2550	66.1	34.8	7.6	56.2	19.5	43.7
Abe	67.2	34.1	8.5	53.8	19.5	46.3
Avg. all checks	66.3	33.8	8.7	54.2	19.5	44.8
<u>Avg. '80 Data (7 test/loc.)</u>						
2550	70.0	38.1	9.4	55.4	18.8	32.7
Abe	70.2	36.1	10.4	53.7	18.7	32.2
Avg. all checks	69.1	36.2	10.4	54.4	18.6	31.7

NOTES: Locations tested include: Loogootee, Illinois; Fort Branch and Tipton, Indiana; and Tiffin, Ohio

Check samples include various combinations of: Abe, Beau, Coker 68-15, Double Crop, Funk W504, Hart, McNair 3001, Oasis, Roland, Ruler, Sullivan and Titan

Methods: Milling - Brabender Quadramat Sr. Mill
 Protein - Udy method
 AWRC - Micro method on milled flour
 Cookie diameter - Total diameter of two cookies
 PSI - Through '79 - Sonic sifter
 - From '80 on - A B grinder, sieve shaker